XR for EV Technician Upskilling

Preparing Technicians for High-Voltage Systems

The Growth of Electric Vehicles

18M+

EVs Sold Globally

in 2023 alone, with projections rising sharply year on year

40%

New Car Sales

projected to be electric by 2030 across major markets

3x

More Complex

EV powertrains versus conventional internal combustion systems

Rising EV adoption is outpacing the availability of qualified technicians. Workshops and training institutions face growing pressure to upskill their workforce quickly and safely.

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EV Systems Overview

Modern electric vehicles introduce a range of high-voltage and software-driven systems that demand specialist knowledge and rigorous safety compliance.

High-Voltage Battery Packs

Operating at 400–800V, these systems require strict handling protocols and in-depth structural knowledge.

Battery Management System

The BMS monitors cell health, thermal management, and charge balance — a critical diagnostic interface.

Electrical Safety Requirements

Personal protective equipment, isolation procedures, and live-system awareness are non-negotiable competencies.

Fault Diagnostics

Identifying faults across BMS, thermal, and drivetrain systems using specialist scan tools and data interpretation.

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CURRENT APPROACH

Traditional Training Methods

Most EV technician training today still relies on a combination of established instructional approaches:

Printed Manuals & Technical Documents

Manufacturer service guides and safety data sheets form the knowledge baseline.

Classroom Instruction

Theory-led sessions covering electrical principles, system architecture, and safety regulations.

Supervised Workshop Practice

Hands-on exposure with a qualified instructor present — limited by vehicle and component availability.

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Training Challenges

Traditional methods struggle to meet the demands of modern EV training. Several structural barriers slow effective workforce development.

Limited Access to Live Systems

High-voltage EV platforms are expensive, scarce, and rarely available for repeated trainee use in workshop environments.

Inherent Safety Risks

Novice technicians working near 400–800V systems present significant occupational hazards without adequate prior preparation.

High Component Costs

Battery modules, inverters, and BMS hardware are costly to procure solely for training purposes and vulnerable to mishandling.

Difficulty Recreating Faults

Realistic fault scenarios — thermal events, cell degradation, isolation failures — are difficult and unsafe to reproduce on demand.

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The Case for Experience-Based Training

Technical knowledge alone is insufficient when working with high-voltage systems. Technicians must develop procedural fluency, spatial awareness, and confident decision-making *before* they encounter live systems.

Procedural Confidence

Repeated exposure to isolation and reinstatement sequences builds reliable, safe habits.

Error Recognition

Trainees must learn to identify unsafe conditions before they escalate — not while managing them.

Readiness for Live Work

Competency frameworks increasingly require demonstrated practice before sign-off on high-voltage tasks.

How XR Supports EV Training

Extended reality technologies — including virtual reality (VR) and augmented reality (AR) — enable immersive, scenario-based training that bridges the gap between classroom and workshop.

Battery Repair Simulations

Trainees disassemble and reassemble virtual battery packs, learning spatial layouts and safe handling sequences.

Fault Diagnostics Practice

Simulated fault trees and BMS data allow trainees to practise interpretation and diagnosis without real-world risk.

Safety Procedure Walkthroughs

Step-by-step isolation, PPE checks, and reinstatement protocols are practised in a fully guided virtual environment.

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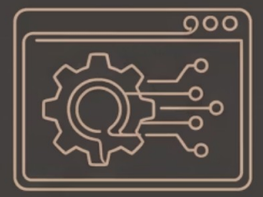
Risk-Free Practice – no exposure to live high-voltage systems.



Repeatable Scenarios - same fault conditions recreated on demand.

Improved Confidence – trainees build competence before live work.

Measurable Skill Development – progress tracked across sessions.

KEY ADVANTAGE

Safe & Repeatable Practice

XR training environments allow technicians to practise high-risk procedures as many times as necessary — without consequence. Every scenario can be reset, varied, and assessed objectively.

This combination of **safety, repetition, and measurable feedback** accelerates competency development in ways that traditional training cannot replicate at scale.

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Industry Context

Organisations across the automotive and industrial training sectors are beginning to formalise XR-based approaches to workforce preparation.

A Growing Field

XR training for high-voltage and safety-critical tasks is gaining traction across automotive, energy, and manufacturing sectors.

RadiumXR

RadiumXR is one organisation developing XR-based industrial training environments specifically for EV and automotive workforce preparation — focusing on practical, scenario-led learning.

Standardisation Ahead

As competency frameworks mature, immersive training environments are increasingly likely to become a standard component of EV technician certification pathways.

Learn More

If you are exploring XR-based training solutions for your EV workforce, the following resources provide a starting point for understanding what is available and how it may apply to your organisation.

Explore the Full Solution

Visit the RadiumXR website to review their approach to XR-based EV and automotive technician training.

Visit radiumxr.com

Get in Touch

For enquiries about XR training environments, workforce integration, or programme suitability, reach out directly.

contact@radiumxr.com

This presentation is intended for informational and educational purposes. It is designed for training managers, technical leads, and workforce development stakeholders in the EV service industry.

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